

National Park Service  
U.S. Department of the Interior

Fort McHenry National Monument and Historic Shrine  
Baltimore, Maryland



# Fort McHenry

## *Alternative Transportation Study*

### Appendix E

May 2004

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Research and Special Programs Administration  
U.S. Department of Transportation



## **Appendix E**

### **Dock Enhancement Options**

*Detailed information—including renderings and cost estimates—prepared by David Porter of Childs Engineering.*

## **Ft. McHenry Accessible Docking Alternatives**

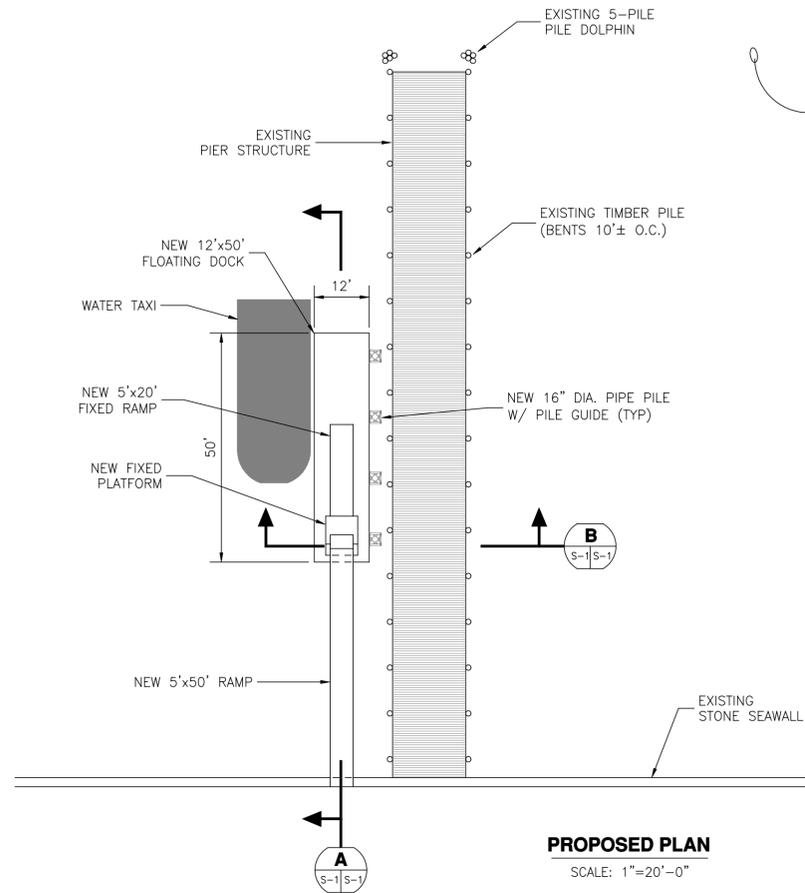
The existing harbor taxi berth at the Ft. McHenry National Park Service site is a fixed pier structure owned by the City of Baltimore. The pier is of conventional timber construction, approximately 150 feet long by 16 feet wide extending perpendicular from the existing stone seawall into the harbor. At the time of our site investigation, the pier had undergone significant damage as a result of a recent hurricane experienced in the mid-Atlantic region. The major damage was the loss/displacement of the timber deck and joists. The sub structure (piles, pile caps and bracing) appeared to be intact. Based on the observed conditions it appeared that the pier was repairable and does not require a full rebuild.

Currently there are two operators running harbor taxis that could provide service to the fixed pier at Ft. McHenry (although only one does so at present). Both operators run a combination of vessels. In general, the inner and outer harbor taxis are pontoon boats powered by outboard motors. The pontoon boats have a freeboard to the passenger deck of between 19 and 24 inches. One of the operators currently uses a conventional hull vessel approximately 26 feet long with a freeboard of 27 inches.

Baltimore Harbor has a tidal range of just under 2 feet. Tidal fluctuation occurs throughout the day between low water and high water over this 2-foot range. The current dock at Ft. McHenry has a freeboard at low water of approximately 5 feet and a freeboard at high water of approximately 3 feet. As a result of this condition, harbor taxi users must climb up a set of steps to access the deck level of the existing pier. This fixed pier condition is found at several of the harbor taxi stops within the Baltimore Inner Harbor. Other locations have been equipped with floating docks with ramps where the floating dock is at a freeboard closer to the existing harbor taxis' freeboards and access to the land is via an articulating ramp. Although there are ramps at these locations they did not appear to meet ADA requirements for access, but were easier to negotiate than steps.

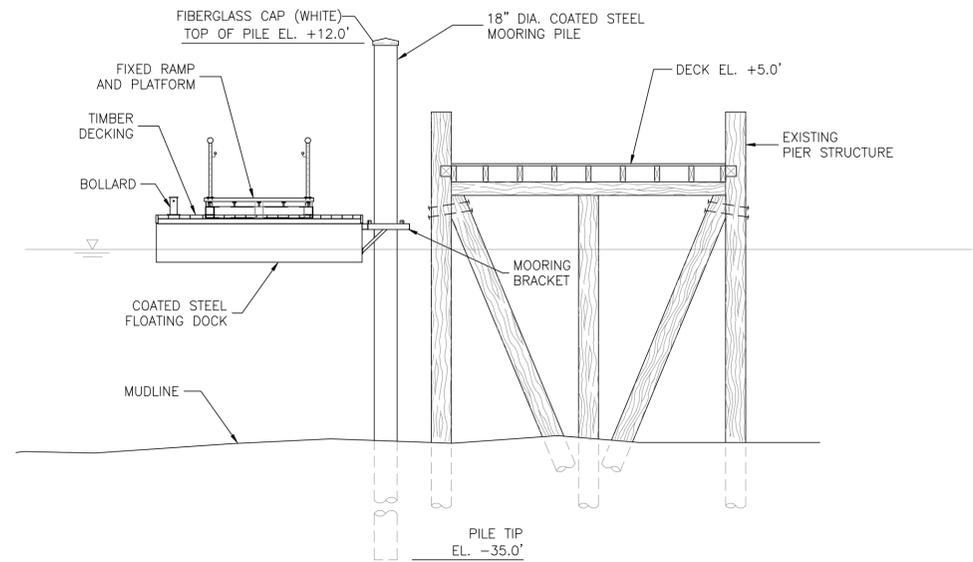
The two alternatives for the rehabilitation of the Ft. McHenry harbor taxi berth utilize a floating dock for the principle berthing element. The floating dock would have a designed freeboard of 24 inches which closely simulates the existing vessels in service in the harbor and provides for a fixed ramp on the floating dock and a 50-foot long articulating ramp from land or the pier to the floating dock. This configuration allows a maximum ramp slope of 1 on 20 from the deck of the floating dock to land under normal tidal conditions. This is a gradual slope by ADA definition and is not a ramp, but a sloping walk such as a sidewalk. With these gentle slopes, accessibility for those in wheelchairs and other disabilities would meet ADAAG specifications and would be a significant improvement over the current need to climb steps or receive assistance to move from the deck of the vessel to the fixed pier elevations.

There are several options for locating the landside of the main articulating ramp on the proposed system. Option 1 as illustrated, connects to the seawall at Ft. McHenry and is not dependent upon the existence of the fixed pier. Option 2 provides access via the fixed pier through an extension to the pier where the articulating ramp is connected. Conceptual level cost estimate for Option 1 is approximately \$230,000 and Option 2 is approximately \$270,000. There is a variety of designs between the two options for connecting the landside seawall to the floating dock via the main articulating ramp. Options 1 and 2 are illustrated on the attached sketches.

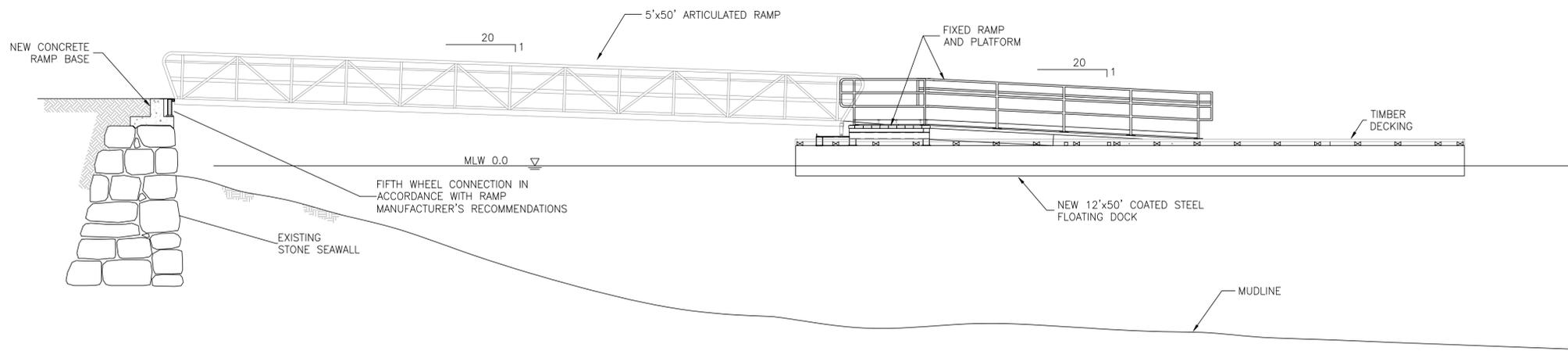


**PROPOSED PLAN**  
SCALE: 1"=20'-0"

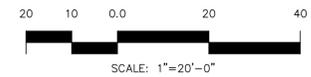
BALTIMORE HARBOR



**B SECTION**  
SCALE: 3/16"=1'-0"



**A SECTION**  
SCALE: 3/16"=1'-0"

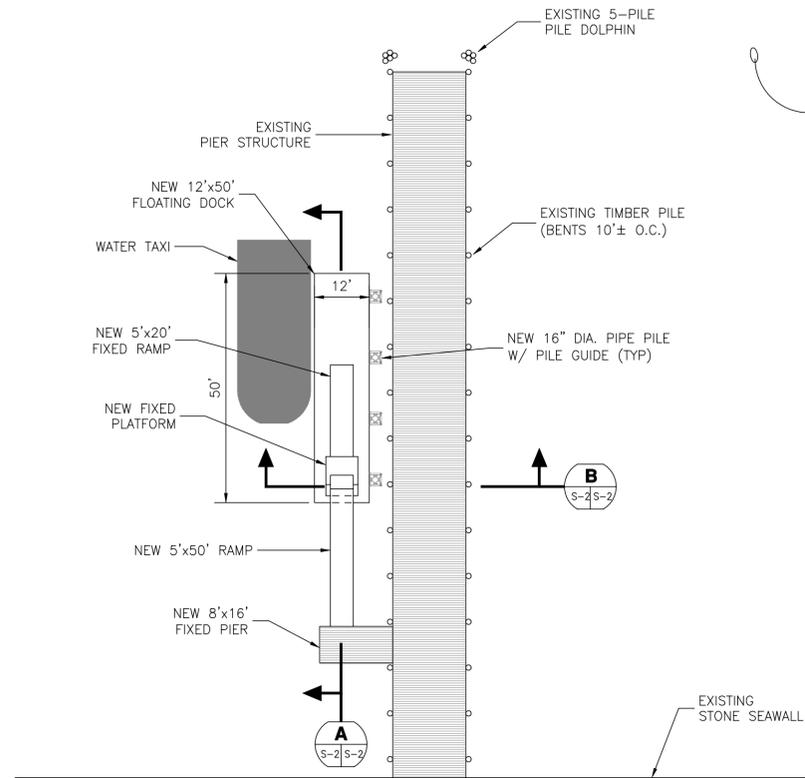


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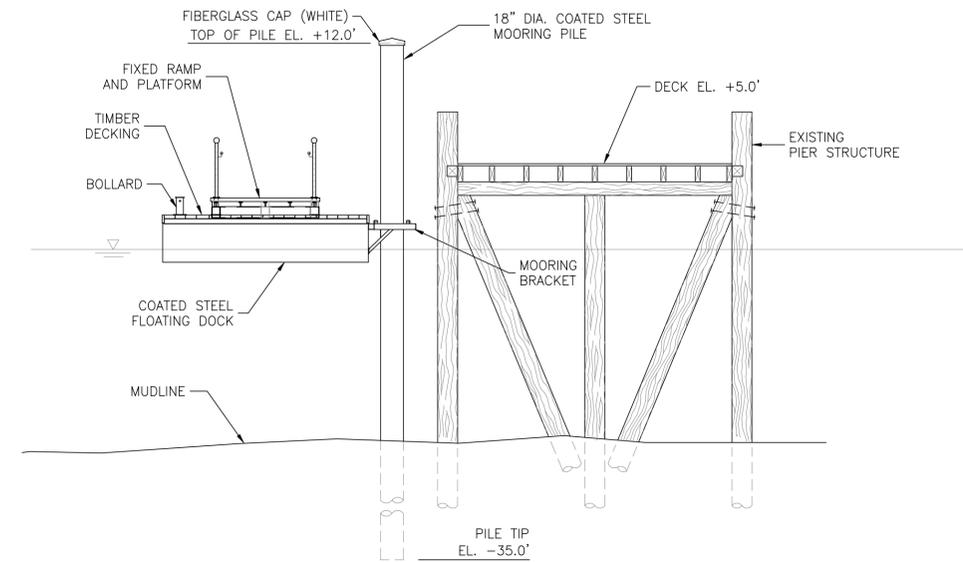
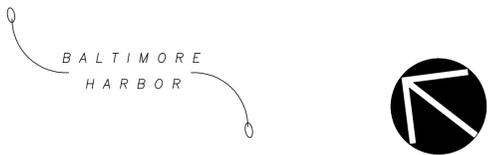
SUB SHEET NO.  
**S1**

TITLE OF SHEET  
**OPTION #1  
PROPOSED  
PLAN & SECTIONS**  
WATER TAXI BERTH  
FORT McHENRY

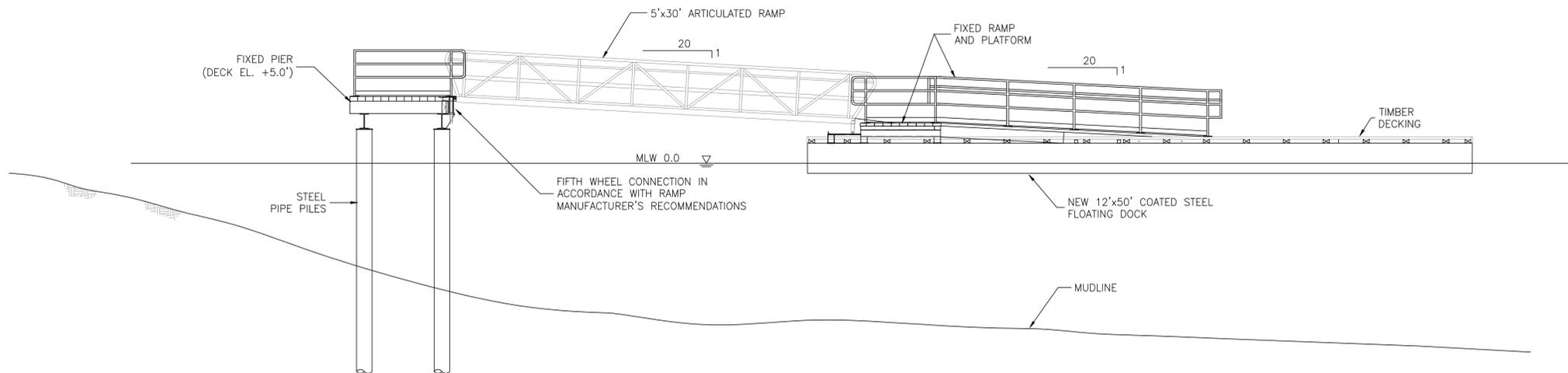
DRAWING NO.  
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PKG. NO. **1**  
?  
?  
SHEET  
OF **2**



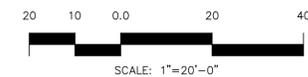
**PROPOSED PLAN**  
SCALE: 1"=20'-0"



**B SECTION**  
SCALE: 3/16"=1'-0"



**A SECTION**  
SCALE: 3/16"=1'-0"



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SUB SHEET NO.  
**S2**

TITLE OF SHEET  
**OPTION #2  
PROPOSED  
PLAN & SECTIONS**  
WATER TAXI BERTH  
FORT McHENRY

DRAWING NO.  
?  
?  
PKG. NO. **2**  
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SHEET  
OF **2**



<b>COST ESTIMATE</b>		DATE PREPARED Nov-03	SHEET 1 OF 1					
ACTIVITY AND LOCATION FORT MCHENRY		IDENTIFICATION NUMBER						
NEW WATER TAXIS FLOATING DOCK WITH PIER ACCESS		CATEGORY CODE NUMBER						
CEC JOB NUMBER 1161-93.7		JOB ORDER NUMBER						
ESTIMATED BY DLP								
STATUS OF DESIGN _X_ PED 35% 65% 100% FINAL OTHER								
ITEM DESCRIPTION	QUANTITY		MATERIAL COST		LABOR COST		ENGINEERING ESTIMATE	
	NO.	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL
FLOATING DOCK	600	SF.					\$150	\$90,000
MOORING PILES	4	EA.					\$8,000	\$32,000
FENDER & BOLLARDS	1	L.S.					\$2,500	\$2,500
RAMP SYSTEM	1	EA.					\$50,000	\$50,000
PIPE PILES	4	EA.					\$6,000	\$24,000
TIMBER DECK	1	L.S.					\$20,000	\$20,000
HANDRAILS	1	L.S.					\$5,000	\$5,000
SUBTOTAL =								\$223,500
CONTINGENCIES 20% =								\$44,700
TOTAL ESTIMATED COST =								\$268,200
RECOMMENDED BUDGET COST =								<b>\$270,000</b>